CLAIMS

[Claim 1]

A method for producing a modified conjugated diene rubber which comprises

(a) a step in which a conjugated diene polymer having an alkali metal or alkaline earth metal active end and obtained by polymerizing a conjugated diene compound or by polymerizing a conjugated diene compound with an aromatic vinyl compound is reacted with a first alkoxysilane compound which has an alkoxysilyl group having two or more alkoxy groups and has a group protected by a protecting group wherein deprotection is possible to obtain a modified conjugated-diene polymer having an alkoxysilyl group and

(b) a step in which the modified conjugated diene polymer having an alkoxysilyl group is reacted with a second alkoxysilane compound which has an alkoxysilyl group~~.~~;

wherein step (b) is conducted in the presence of a condensation catalyst for alkoxysilane compounds which contains a metallic element.

[Claim 2]

The method for producing a modified conjugated diene rubber according to claim 1, wherein the group protected by a protecting group wherein deprotection is possible in the first alkoxysilane compound is one or more members selected from the group consisting of a nitrogen-containing group in which two hydrogen atoms of a primary amine have been replaced by two protecting groups, a nitrogen-containing group in which one hydrogen atom of a secondary amine has been replaced by one protecting group, a sulfur-containing group in which one hydrogen atom of a thiol has been replaced by one protecting group, a phosphorus-containing group in which two hydrogen atoms of a primary phosphine have been replaced by two protecting groups, and a phosphorus-containing group in which one hydrogen atom of a secondary phosphine has been replaced by one protecting group.

~~[Claim 3]~~

~~The method for producing a modified conjugated diene rubber according to claim 1 or 2, wherein step (b) is conducted in the presence of a condensation catalyst for alkoxysilane compounds which contains a metallic element.~~

[Claim ~~4~~3]

The method for producing a modified conjugated-diene rubber according to claim ~~3~~1, wherein the condensation catalyst is a metal compound which contains at least one of the metallic elements that belong to Group 4, Group 12, Group 13, Group 14, and Group 15 of the periodic table.

[Claim ~~5~~4]

The method for producing a modified conjugated diene rubber according to claim ~~4~~3 wherein an alkoxide, carboxylic acid salt, or acetylacetonato complex salt of the metallic element is used as the condensation catalyst.

[Claim ~~6~~5]

The method for producing a modified conjugated-diene rubber according to any one of claims 1 to ~~5~~4, comprising (c) a step in which a mixture obtained in step (b) is allowed to contact with water.

[Claim ~~7~~6]

A modified conjugated diene rubber obtained by the method for producing a modified conjugated-diene rubber according to any one of claims 1 to ~~6~~5.

[Claim ~~8~~7]

A rubber composition which comprises the modified conjugated diene rubber according to claim ~~7~~6, silica and/or carbon black, and a crosslinking agent.

[Claim ~~9~~8]

A crosslinked rubber composition obtained by crosslinking the rubber composition according to claim ~~8~~7.

[Claim ~~10~~9]

A tire which comprises the crosslinked rubber composition according to claim ~~9~~8.

CLAIMS

[Claim 1]

A method for producing a modified conjugated diene rubber which comprises

(a) a step in which a conjugated diene polymer having an alkali metal or alkaline earth metal active end and obtained by polymerizing a conjugated diene compound or by polymerizing a conjugated diene compound with an aromatic vinyl compound is reacted with a first alkoxysilane compound which has an alkoxysilyl group having two or more alkoxy groups and has a group protected by a protecting group wherein deprotection is possible to obtain a modified conjugated-diene polymer having an alkoxysilyl group and

(b) a step in which the modified conjugated diene polymer having an alkoxysilyl group is reacted with a second alkoxysilane compound which has an alkoxysilyl group;

wherein step (b) is conducted in the presence of a condensation catalyst for alkoxysilane compounds which contains a metallic element.

[Claim 2]

The method for producing a modified conjugated diene rubber according to claim 1, wherein the group protected by a protecting group wherein deprotection is possible in the first alkoxysilane compound is one or more members selected from the group consisting of a nitrogen-containing group in which two hydrogen atoms of a primary amine have been replaced by two protecting groups, a nitrogen-containing group in which one hydrogen atom of a secondary amine has been replaced by one protecting group, a sulfur-containing group in which one hydrogen atom of a thiol has been replaced by one protecting group, a phosphorus-containing group in which two hydrogen atoms of a primary phosphine have been replaced by two protecting groups, and a phosphorus-containing group in which one hydrogen atom of a secondary phosphine has been replaced by one protecting group.

[Claim 3]

The method for producing a modified conjugated-diene rubber according to claim 1, wherein the condensation catalyst is a metal compound which contains at least one of the metallic elements that belong to Group 4, Group 12, Group 13, Group 14, and Group 15 of the periodic table.

[Claim 4]

The method for producing a modified conjugated diene rubber according to claim 3 wherein an alkoxide, carboxylic acid salt, or acetylacetonato complex salt of the metallic element is used as the condensation catalyst.

[Claim 5]

The method for producing a modified conjugated-diene rubber according to any one of claims 1 to 4, comprising (c) a step in which a mixture obtained in step (b) is allowed to contact with water.

[Claim 6]

A modified conjugated diene rubber obtained by the method for producing a modified conjugated-diene rubber according to any one of claims 1 to 5.

[Claim 7]

A rubber composition which comprises the modified conjugated diene rubber according to claim 6, silica and/or carbon black, and a crosslinking agent.

[Claim 8]

A crosslinked rubber composition obtained by crosslinking the rubber composition according to claim 7.

[Claim 9]

A tire which comprises the crosslinked rubber composition according to claim 8.